What is claimed is:

1. A speed change apparatus for motor vehicles comprising:

a first shaft (100) for receiving power from a prime mover via a torque converter (10),

a second shaft (200) disposed in parallel to the first shaft (100) for transmitting the power therethrough,

a third shaft (300) provided in parallel to the second shaft (200) for delivering the power through a differential gear (40),

first and second planetary gear sets (20)(30) provided on the second shaft (200) and comprising first, second and third elements for receiving power and a fourth element for delivering power therethrough,

first, second and third drive paths for connecting the first shaft (100) to the first, second and third elements of the first and second planetary gear sets (20)(30),

first, second and third counter gear sets (1)(2)(3) providing the first, second and third drive paths respectively and each comprising two gears in mesh with each other,

clutches (C1)(C2)(C3) provided in the first, second and third drive paths respectively,

brakes (B2)(B1) provided in the respective second and third drive paths for braking the respective second and third elements,

a one-way clutch (232) provided in the third drive path for braking the third element only in a direction opposite to the direction of rotation thereof in which power is input, and

a fourth counter gear set coupling the second shaft (200) to the third shaft (300),

the apparatus being a six-forward-speed, one-reverse-speed automatic speed change apparatus wherein:

a ring gear (23) of the first planetary gear set (20) serves as the first element having the first drive path connected thereto,

a planetary carrier (24) supporting planetary gears (22) in mesh with the ring gear (23) serves as the fourth element,

a sun gear (21) meshing with the planetary gears (22) is joined to a sun gear (31) of the second planetary gear set (30) to provide the second element having the second drive path connected thereto,

a planetary carrier (34) supporting planetary gears (32) in mesh with the sun gear (31) serves as the third element having the third drive path connected thereto,

a ring gear (33) meshing with the planetary gears (32) serves as the fourth element,

the planetary carrier (24) and the ring gear (23) serving as the fourth elements are joined to the second shaft (200) for transmitting power therethrough, and

two of the clutches (C1)(C2)(C3) for controlling the first, second and third drive paths, the brakes (B2)(B1) and the one-way clutch (232) are selectively engaged to obtain seven speeds.

2. A six-forward-speed, one-reverse-speed automatic speed change apparatus according to claim 1 wherein the first, second and third drive paths for coupling the first shaft (100) to the second shaft (200) are arranged in this order in the direction of the torque converter (10),

the first planetary gear set (20) is disposed on the second shaft (200) between the first and second drive paths,

the second planetary gear set (30) is disposed on the second shaft (200) between the second and third drive paths,

the clutch (C1) provided in the first drive path and the brake (B1) and the one-way clutch (232) provided in the third drive path are arranged on the second shaft (200),

the clutch (C2) and the brake (B2) provided in the second drive path and the clutch (C3) provided in the third drive path are arranged on the first shaft (100), and

the fourth counter gear set coupling the second shaft (200) to the third shaft (300) is disposed closer to the torque converter (10) than the first drive path.

3. A six-forward-speed, one-reverse-speed automatic speed change apparatus according to claim 1 wherein the ring gear (23) serving as the first element of the first planetary gear set (20) is held between the planetary carrier (24) and the counter gear (210) provided on the second shaft (200) and included in the first counter gear set (1) by a plate connected to the ring gear (23) by means of a thrust bearing,

the sun gear (21) and the sun gear (31) joined together and providing the second element are integral with the counter gear (220) provided on the second shaft (200) and included in the second counter gear set (2),

the planetary carrier (34) serving as the third element is supported by a bush on the second shaft (200) and connected

to the counter gear (230) provided on the second shaft (200) and included in the third counter gear set (3) by a joint at an outer peripheral portion of the second planetary gear set (30),

the planetary carrier (24) and the ring gear (23) serving as the fourth elements are splined to the second shaft (200) for transmitting power therethrough respectively at different positions, and

a spline hub of the ring gear (33) has splined bore opposite end portions fitting around the second shaft (200) so as to be coaxial therewith.

4. A six-forward-speed, one-reverse-speed automatic speed change apparatus according to claims 1 wherein the counter gear (110) of the first counter gear set (1) providing the first drive path is integral with the first shaft (100), and the counter gear (210) meshing with the counter gear (110) is rotatably held by a needle roller bearing (211) on the second shaft (200),

the counter gear (120) of the second counter gear set (2) providing the second drive path is rotatably held by a needle roller bearing (121) on the first shaft (100), and the counter gear (220) meshing with the counter gear (120)

is rotatably held by a needle roller bearing (221) on the second shaft (200),

the counter gear (130) of the third counter gear set (3) providing the third drive path is rotatably held by a needle roller bearing (131) on the first shaft (100), and the counter gear (230) meshing with the counter gear (130) is rotatably held by a needle roller bearing (231) on the spline hub integral with the ring gear of the second planetary gear set,

the counter gear (110) integral with the first shaft (100) has an inner periphery thereof supported by a cylindrical roller bearing (140) on a support fixed to a housing (5) of the speed change apparatus to thereby support the first shaft (100), and the first shaft (100) is supported by a wall portion (5a) and a boss portion (5b) which are integral with the housing (5) of the speed change apparatus by means of needle roller bearings (150) and (160), and

the second shaft (200) has opposite ends thereof supported respectively by tapered roller bearings (250) and (260) on a torque converter housing (4) and a rear cover (6) which are fixed to the housing (5) of the apparatus.

5. A six-forward-speed, one-reverse-speed automatic speed change apparatus according to claims 1 wherein the

clutches (C1)(C2)(C3) for controlling the respective first, second and third drive paths and the brakes (B2) (B1) are hydraulic actuators having first, second, third, fourth and fifth friction members, piston and piston return springs respectively, and the one-way clutch for controlling the third drive path is a mechanical actuator,

the clutch (C1) provided on the second shaft (200) has the first friction members arranged at an outer peripheral portion of the first planetary gear set (20), a connecting-holding member welded to the counter gear (210) and holding one of the first friction members against rotation but axially movably, the first piston and the first return spring which are held by the counter gear (210), and an outer peripheral connecting portion of the ring gear (23) for holding the other first friction member against rotation but axially movably,

the brake (B1) provided on the second shaft (200) has the fifth friction members arranged at an outer peripheral portion of the second planetary gear set (30), a connecting-holding member integral with the wall portion 5a of the housing 5 for holding one of the fifth friction members against rotation but axially movably, the fifth piston held by the rear cover 6 supporting the tapered roller bearing

(260) and having a cutout at a portion thereof to be interfered with by the counter gear (130), the fifth return spring, and a connecting-holding member extending from the planetary carrier (34) for holding the other fifth friction member against rotation but axially movably,

the one-way clutch (232) provided on the second shaft (200) having an inner race connected to the rear cover 6 holding the piston of the brake (B1) and an outer race provided by the inside of an outer peripheral portion of the counter gear (230),

the clutch (C2) provided on the first shaft (100) has the second friction members arranged at the same position as the first friction members of the clutch (C1) with respect to the axial direction, a connecting-holding member welded to the counter gear (110) and holding one of the second friction members against rotation but axially movably, the second piston and the second return spring which are held by the first shaft (100) and the counter gear (110), and a connecting-holding member welded to the counter gear (120) and holding the other second friction member against rotation but axially movably,

the brake (B2) provided on the first shaft (100) has the fourth friction members arranged at the same position as the

fifth friction members of the brake (B1) with respect to the axial direction, a connecting-holding member of the housing (5) for holding one of the fourth friction members against rotation but axially movably, the fourth piston and the fourth return spring which are held by the boss portion (5b) and the wall portion (5a), and a connecting-holding member welded to the counter gear (120) and holding the other fourth friction member against rotation but axially movably, and

the clutch (C3) provided at an end portion of the first shaft (100) has a clutch case splined to the first shaft (100), one of the third friction members held by the clutch case against rotation but axially movably, the third piston and the third return spring which are held by the clutch case, and a connecting-holding member welded to the counter gear (130) and holding the other third friction member against rotation but axially movably.

6. A six-forward-speed, one-reverse-speed automatic speed change apparatus according to claim 1 wherein the reduction gear ratios of the respective counter gear sets (1)(2)(3) providing the first, second and third drive paths obtained by dividing the numbers of teeth of the counter gears (210)(220)(230) on the second shaft (200) by the

respective numbers of teeth of the counter gears (110)(120)(130) on the first shaft (100) and meshing therewith are so determined that the counter gear set (1) and the counter gear set (2) are the same or different in reduction gear ratio, and the counter gear set (3) is smaller than the counter gear sets (1)(2) in reduction gear ratio.

7. A six-forward-speed, one-reverse-speed automatic speed change apparatus according to claims 1 wherein inlets to the first shaft (100) of first and second oil channels (401)(402) for guiding a hydraulic oil to the clutches (C2)(C3) on the first shaft (100) are formed by circumferential grooves in an outer periphery of the first shaft (100) and three rotating seal rings around the outer periphery and in contact with an inner peripheral portion of the support fixed to the housing (5),

an inlet to the first shaft (100) of an third oil channel (403) for guiding a supply oil of low pressure to bearings, etc. arranged for the first shaft (100) is formed in side portions of the support (7) and the gear (110) by one rotating seal ring in contact with an inner peripheral portion of the counter gear (110) and disposed around the support (7) for the cylindrical roller bearing (140), a

circumferential groove formed in the outer periphery of the first shaft (100) and a rotating seal ring adjacent to said one rotating seal ring, and

an inlet to the second shaft (200) of an fourth oil channel (404) for guiding a hydraulic oil to the clutch (C1) on the first shaft (100) and an inlet to the second shaft (200) of an fifth oil channel (405) for guiding a supply oil of low pressure to bearings, etc. arranged for the second shaft (200) are formed in a stepped bore formed in the second shaft (200) at one end thereof where the tapered roller bearing (250) is positioned, the inlets being defined by two rotating seal rings which are provided around an outer periphery of stepped portion of a channel-attached member fastened to the torque converter housing (4) and which are in contact with respective two portions, having different diameters, of an inner periphery of the shaft end defining the stepped bore, the inlets being formed in an upper part of the stepped bore and in the center of the stepped bore.

8. An automatic speed change apparatus for motor vehicles wherein a first shaft (100) for receiving power, a second shaft (200) for transmitting the power therethrough and a third shaft (300) for delivering the power are

arranged in parallel, and planetary gear sets are arranged on the second shaft (200), the second shaft (200) being coupled to the third shaft (300) by a fourth counter gear set having a counter gear (340) on the third shaft (300) and provided with a parking gear (341).